

1.1	BLOW-OUT PREVENTERS (I.E., COOPERATING SEGMENTS OF ANNULUS)	30.05	....Fluid pressure sole means for biasing valve closed
1.2	..Deformable annulus	31	..Double or oppositely acting motor units
1.3	..Radial reciprocating ram	32	..Latched pilot valve
3	PATTERN TRACER CONTROLLED ACTUATOR	33	..Choked pressure type servo motor
4	TUBE COMPRESSORS	34	...With reverse flow preventing (nonsiphoning)
5	..Fluid pressure actuated	35	...Variable choke passage according to valve position
6	..Roller tube contacting element	36	...With separate dashpot or choked fluid retarding chamber
7	..Perpendicularly reciprocating tube contacting element	37	...With choke or restrictor in main line
8	..Screw actuated	38	...Pilot valve seated in motor or valve element
9	..Pivoting tube contacting element	39	....Controls inlet to choke chamber
10	..U-shaped resilient bar or rod	40	....Tilting pilot valve
11	HEAT OR BUOYANCY MOTOR ACTUATED	41	...Remote pilot valve actuation
12	FLUID ACTUATED OR RETARDED	42	...Adjustable opening limit for main valve
14	..Fluid and non-fluid actuators	43	...Main valve biased open by line pressure
15	..Compulsory cut-off after flow period	44	....Differential reaction surface for line pressure
16	..Serial main line cut-off and manual valves (e.g., hydraulic "fuses")	45	....Diaphragm or bellows surface
17	...Interconnected motion	46	....Diaphragm or bellows motor element
18	....Manual and pilot valves	47	..With separate dashpot or choked fluid retarder
19	..Auxiliary pilot valve overrides a first pilot valve	48	..Dashpot or fluid controlled retarder or timer
20	..Forced return of actuator to cut-off position	49	..Latch or trip releasing
21	..Actuator connection released on opening of cut-off valve	50	..Line pressure connected dashpot or choke chamber
22	..Control fluid released into closed build-up chamber	51	...With choke by-pass or relief means
23	..Dashpot interconnects actuator and valve	52	...Chamber fills on closing of main valve
24	..Venturi or line flow effect assisted	53	..Line connected open accumulating chamber
25	..Pilot or servo type motor	54	..Closed fluid circuit dashpot or choke chamber
26	..Alternative pressure sources or pilot valve	55	..With choke by-pass or relief means
27	..Servo failure responsive control of main valve	56	..Plural operations (e.g., lifting and rotating rotary valve)
28	..Fluid actuated pilot valve	57	..Fluid link or column actuator
29	...With additional pilot valve control	58	..With mechanical movement between actuator and valve
30.01	..Electrically actuated pilot valve	59	..Rotary or oscillatory motor
30.02	...Main valve biased closed by fluid pressure		
30.03	....Venting passage within movable main valve		
30.04	.....Pilot valve movably mounted within or around main valve		

60	.With adjustable limit stop for actuator	86	.With universal connection
61	.Flexible wall expansible chamber reciprocating valve actuator	87	.With single plane swing pivoted connection
61.1	..Flexible wall valves fluid	88	.Rotatable only
61.2	..Coaxial actuator, seat and valve	89	WITH MEANS FOR BLOCKING OR DISABLING ACTUATOR
61.3	...Valve between coaxial spring biasing means and actuator	89.5	.Actuator, or blocking means, includes flow path joint
61.4	...Coaxial spring biasing means between valve and actuator	90	.Attachments
61.5	...Actuator wall between valve and coaxial spring biasing means	91	..Requiring modification of valve
62	.Piston type expansible chamber reciprocating valve actuator	92	..Acting on valve limit stop
63	..Unitary piston and valve	93	...Mounted on valve actuator
63.4	..Lost motion, abutment or resilient connection between actuator and valve	94	.Fluid pressure biased latch
63.5	..Coaxial actuator, seat and valve	95	.Released by non-valving actuator motion
63.6	...Coaxial spring biasing means between valve and actuator	96	..Linear reciprocation of rotary handle
64	WITH NON-FLUID RETARDER	97	...Latch connects actuator to body through head
65	PERMANENT OR CONSTANTLY ENERGIZED MAGNET ACTUATOR	98	..Pivoted handle
66	BIASED TRIP	99	...With spring
67	.With second diverse control	100	..Rotation of reciprocating handle
68	.Electrical trip actuation	101	.Latch manipulator mounted on handle or stem
69	..Trip operated on failure of electric power	102	..Constrained linear motion
70	..With electrical resetting means	103	...With pivoted latch
71	...Rotary electric motor	104	...With latch rigidly associated with manipulator
72	.Weight biased trip	105	....Latch lug extends transversely to axis of manipulator
73	.Fluid pressure trip actuation	106	...With transversely movable latch
74	.Mechanical movement trip actuation	107	..With pivoted latch
75	WITH SNAP ACTION	108	...Resilient latch and manipulator
76	IMPACT TYPE ACTUATOR	109	...With spring
77	LOST MOTION BETWEEN ACTUATOR AND VALVE	110	..With reciprocating latch
78	.Lever	111	.Latch manipulator mounted on valve body
79	.Overload release	112	..Set screw
80	..Elastic	113	..Constrained linear motion of latch with rigidly associated manipulator
81	..Slip coupling between actuator and valve	114	..With pivoted latch
82	.Check valve with external opening and closing means	115	...Resilient latch and manipulator
83	..Spring	116	...With spring
84	VALVE HEAD MOVABLY CONNECTED FOR ACCOMMODATION TO SEAT	117	WITH RESTRICTOR IN PARALLEL TO MAIN VALVE
85	.With yieldable connection	118	WITH MATERIAL GUIDE OR RESTRICTOR
		119	.Aspirated stem drain

120	.Movable or resilient guide or restrictor	149.4	...Joint includes screw thimble
121	..Adjustable guide or restrictor	149.5	...Of rotatable flow path section
122	...Tapered metering plug	149.6	...Motion opposed by valve spring
123	.Valve at point of greatest restriction	149.7	....Contact only, or friction, joint
124	..Venturi restrictor	149.8	.Valve operated by motion of flow path
125	.Drop forming restrictor	149.9	.Flow path joint interlocked with valve or actuator
126	.Spiral guide or spiral restrictor	144	.Tank
127	.Baffle or zigzag flow restrictor	145	.Pipe side
128	WITH DETACHABLE ACTUATOR AND MEANS TO PREVENT LEAKAGE WHEN ACTUATOR IS DETACHED	146	..Clamp type coupling
129.01	ELECTRICALLY ACTUATED VALVE	147	.Pipe end (terminal valve)
129.02	.With means to bias valve open	148	.Pipe coupling or union
129.03	.With nonelectrical actuator	150	..Flexible or expansible
129.04	.Remote or follow-up control system for electrical actuator	151	..Non-rotatable conduit coupling
129.05	.Having means to produce digital pulses	152	..Valve seat and coupling element removable as a unit
129.06	.Having element dimensionally responsive to field	143	.With mounting or support
129.07	.Balanced valve	153	.With particular outlet or inlet
129.08	.Having means to produce proportional flow	154	..Fluid deflecting means at outlet
129.09	.Solenoid having plural coils	155	..Nozzle or spout
129.1	..Coils have common axis	156	...With receptacle accommodating feature
129.11	.Rotary electric actuator	157	WITH MEANS TO INCREASE HEAD AND SEAT CONTACT PRESSURE
129.12	..With limit control	158	.With positive reduction
129.13	..With speed or braking control	159	..Seat pressed to valve
129.14	.Freely rotatable ball valve	160	..Rotary valve
129.15	.Including solenoid	161	...Independent actuation
129.16	..Having plate-shaped armature	162	...Cam or wedge
129.17	..Having diaphragm between coil and opening controlled	163	....Encased
129.18	..With means to adjust stroke of armature	164	...Screw
129.19	..Lost motion between valve and valve actuator	165	....Non-reciprocating
129.2	..Mechanical movement between valve and solenoid	166	.....With slip coupling
129.21	..Coil surrounds valve port or flow line	167	..Bifaced
129.22	..Solenoid within flow line	168	...Screw
142	WITH CORRELATED FLOW PATH	169	...Toggle
149	.Valve operated by joining flow path sections	170	.Seat pressed to valve
149.1	..Joining motion includes linear valve operating component	171	..Packing pressed by gland
149.2	...Valve rotatably or hingedly mounted	172	..Fluid pressure
149.3	...Valve motion is transverse to, or opposed to, the linear component	173	...Butterfly valve
		174	..Spring
		175	.Fluid pressure
		176	.Spring
		177	..Pivoted valve
		178	...Bifaced
		179	...Terminal
		180	..Rotary valve
		181	...Plug
		182	....Expanding
		183	....Encased
		184	.....At actuator end

185	...Spring in fluid	224	....Sleeve flange mounted between body and bonnet
186	..Piston	225	..Threads in removable sleeve
187	..Separate actuators or actuator motion	226	..Biased
188	..Rotary valve	227	...Spring
189	..Piston with expansible packing	228	..With pivoted valves
190	..Piston	229	..Plural dissimilar mechanical movements
191	..Packing expands with closing	230	..Ratchet
192	..Rotary valve	231	..Lever
193	..Gate valve	232	..Train (plural serial)
194	..Screw sole actuator of expander and valve	233	..Leverage variable during operation
195	..Bifaced	234	..Adjustable leverage
196	...In both closed and open positions	235	..Swiveled
197	...Faces pressed by subsequently movable expander	236	..Biased
198	....With second expander	237	...Sliding contact
199	....Face element directly contacts casing	238	....Spring
200	...Carried expander contacts valve casing	239	.....Spring co-axial with valve arm
201	....Pivoting expander	240	.....Spring stop on valve stem
202	...Faces or carrier contact stationary expander	241	.....Spring abuts valve stem guide
203	..Cam or wedge	242	...Spring
204	...Moves with respect to head and seat	243	....Co-acts with lever
205	WITH SELECTIVE FLOW REGULATION	244	....Co-axial with valve stem
206	..Different sized bores in valve head	245	.....Spring stop on valve stem
207	..Rotary plug	246	.....Spring abuts valve stem guide
208	..Rotary	247	...Weight
209	..Plug	248	..Gear
210	SEQUENTIAL OPENING OR CLOSING OF SERIAL PORTS IN SINGLE FLOW LINE (E.G., ANTI-SCORING)	249	..Mutilated or Geneva gearing
211	SERIAL ALTERNATELY CLOSED PORTS	249.5	..Worm type
212	RELATIVELY MOVABLE VALVE ELEMENTS FORM SINGLE PORT CLOSURE (E.G., IRIS DIAPHRAGM)	250	..Rectilinear rack
213	MECHANICAL MOVEMENT ACTUATOR	250.5	..Mating segments
214	..Particularly packed or sealed	251	..Cam
215	..Plural motions of valve	252	..Co-axial or parallel axes
216	..Screw threads in flow path	253	...Biased
217	..Valve head between actuator and screw	254	....Bi-directional
218	..Encased	255	.....Non-reciprocating
219	...Threadlessly coupled to screw	256	....Encased
220	....Coupling socket in screw	257	..Encased with seal
221	...Threads in removable sleeve	258	...Bi-directional
222	....Sleeve removably in bonnet	259	...Cam is finger-like extension
223	....Sleeve is bonnet	260	...Overhung crank type
		261	...Center crank type
		262	..Biased
		263	...Spring
		264	..Screw
		265	..Plural thread
		266	..Non-reciprocating actuator
		267	...Internal thread
		268	....Inverted cup-shape
		269	.....Separable actuator bushing

270	...Removable guide	315.05	...Nonmetallic
271	...Resiliently mounted actuator	315.06	..Having a swinging actuator
272	...Biased	315.07	..Eccentric seating
273	..Internal thread	315.08	..Including trunnion opposite axially extending actuating means
274	..Encased	315.09	...With removable trunnion cover
275	...Biased	315.1	..Housing construction
276	....Spring	315.11	...Head removable perpendicular to flow passage
277	..Biased	315.12	....At the actuator side (i.e., top entry)
278	...Spring	315.13	...Assembled around the head
279	.Linkage	315.14	...Head removable along one side of flow passage
280	..Toggle	315.15	...Having inseparable head
281	BALANCED VALVES	315.16	..Ball construction
282	.Reciprocating	314	.Seat or interface seal
283	.Rotary	316	..Replaceable
284	LIMIT STOP	317	...Deformable material
285	.Adjustable	317.01	...Carried by head
286	.Rotary valve	318	RECIPROCATING VALVE
287	..Stop element on head	319	.Push or pull operator
288	..Stop element on actuator	320	..Biased
289	VALVE ACTUABLE FROM PLURAL POSITIONS	321	...Spring
290	PLURAL SELECTIVE NEUTRAL POSITIONS FOR VALVE OR ACTUATOR	322	....Spring stop on valve stem
291	DETACHABLE ACTUATOR	323	....Spring abuts valve stem guide
292	.Rotary valve	324	.Piston
293	EXTENSION FOR ACTUATOR	325	..With internal flow passage
294	FLEXIBLE ACTUATOR (E.G., BOWDEN WIRE; CHAIN)	326	.Gate
295	PEDAL ACTUATOR	327	..Bifaced
296	PLURAL MOTIONS OF ACTUATOR	328	..Seats
297	WITH FRICTION DETENT	329	..Bodies
298	PIVOTED VALVES	330	.Actuator controlled stem seal
299	.Terminal	331	.Diaphragm
300	..Gate	332	.Diverse material seal at valve interface
301	.Gate	333	.Particular head and seat cooperation
302	..Bifaced	334	..Elastic deformation
303	..Biased	335.1	HERMETIC FLEXIBLE WALL SEAL FOR ACTUATOR
304	ROTARY VALVES	335.2	.Diaphragm
305	.Butterfly	335.3	.Bellows
306	..Head and/or seat packing	336	BIASED VALVE
307	...Adjustable	337	.Springs and spring retainers
308	..Head and stem connections	338	.Weight biased
309	.Plug	339	VALVE ACTUATOR EXTENDING THROUGH FLUID INLET OR OUTLET
310	..Axial and radial bore	340	VALVE ACTUATOR SURROUNDING PIPE, INLET OR OUTLET
311	...Lateral inlet and outlet	341	VALVE ACTUATOR IS VALVE CASING OR EXTENSION THEREOF
312	..Retainer at actuator end	342	.Jointed or flexible wall
313	..Biased		
315.01	.Ball valve		
315.02	..Having a particular hardness (i.e., durometric property)		
315.03	..Of specific material		
315.04	...Ceramic (e.g., glass or fired clay)		

343 .Sleeve valve
344 ..Flow passage in sleeve
345 ..Rotary
346 .Plural motions of valve
347 .Reciprocating valve
348 .Biased valve
349 **VALVE ACTUATOR IS INLET OR OUTLET**
350 .Detachable tip
351 .Plural motions of valve
352 .Rotary
353 .Reciprocating spout
354 .Biased valve
355 **WITH ACTUATION LUBRICATING MEANS**
356 **VALVE**
357 .Removable seat engaging element
358 .Reinforced flexible material
359 .Seats
360 ..Removable
361 ...Mounted between casing
 sections
362 ...Compression or tension
 retained
363 ...With seal
364 ..Head engaging gasket
365 ..Retained by seat deformation
366 .Bodies
367 ..Sectional
368 .Materials
369 **MISCELLANEOUS**

CROSS-REFERENCE ART COLLECTIONS

900 **VALVES WITH O-RINGS**
901 **CURTAIN TYPE VALVES**
902 **SPRINGS EMPLOYED AS VALVES**
903 **NEEDLE VALVES**
904 **SNAP FIT PLUG VALVES**
905 **MOVABLE COIL ELECTRICAL ACTUATOR**
 (E.G., VOICE COIL)

FOREIGN ART COLLECTIONS

FOR **CLASS-RELATED FOREIGN DOCUMENTS**